MDC Science Branch

Walleye Movement in the Black River Basin

Science Notes

Figure 1. Dave Knuth (left) and Paul Cieslewicz (right) with an adult Walleye from the Black River.

Figure 2. Innovasea/Vemco V16 acoustic transmitters.

Figure 3. Acoustic stationary receiver used to detect transmitter.

Walleye Movement in the Black River Basin

By: David Ostendorf, Paul Cieslewicz, and Dave Knuth, Missouri Department of Conservation

Background: Little is known about the movement patterns of adult Walleye in Black River Basin. In this management evaluation we looked at the year-round movement patterns. We had evidence that walleye did move between river systems from past exploitation studies but did not know the extent to which they moved between the rivers. From this study we now know that walleye move freely between river systems in the Black River Basin and should be considered one population and managed as such.

Methods: Walleye were captured using electrofishing and gillnetting from early February through early March below Clearwater Lake dam and around Markham Springs on the Black River. Innovasea/Vemco V16 acoustic transmitters (Figure 2) were surgically implanted in the body cavity of the select fish and then released. The stationary receiver (Figure 3) array consists of 5 receivers in the Black River, 2 in the Current River, 1 in the Spring River, and 2 in the Eleven Point River (Figure 4).

Results: From 2019 to 2022, we surgically implanted transmitters in 24 Walleye (18 females and 6 males). All Walleye were released in the Black River below Clearwater Lake dam. Thirty percent of tagged Walleye moved downstream into Arkansas waters (>100 river miles (RM)). Walleye typically start moving upstream during November, males arrive first and stay on the spawning riffles for about 30

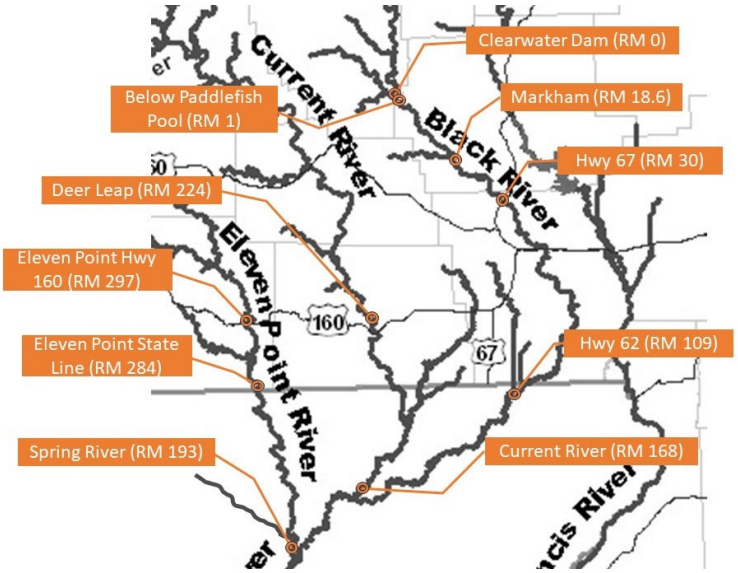

Figure 4. Locations of stationary receivers in the Black, Current, Eleven Point, and Spring rivers.

Table 1. Movement patterns of an 18.2" male Walleye over a 3-year period. RM = River miles from release point.

Walleye	Male 18.2"	
Vemco Tag	31509	
3/10/2020	Released below dam	
3/29/2020	Clearwater Dam RM 0	Spawn 2020
4/12/2020	Hwy 62 RM 109	Headed Downstream
9/20/2020	N/A	Current River VR2 Installed
10/31/2020	Current River RM 168	Headed Upstream
11/7/2020	Hwy 62 RM 109	Headed Upstream
11/12/2020	Hwy 67 Bridge RM 30	Headed Upstream
11/17/2020	Clearwater Dam RM 0	Headed Upstream
4/3/2021	Clearwater Dam RM 0	Spawn 2021
4/9/2021	Hwy 62 RM 109	Headed Downstream
4/10/2021	Current River RM 168	Headed Downstream
11/16/2021	Current River RM 168	Headed Upstream
11/20/2021	Hwy 62 RM 109	Headed Upstream
11/30/2021	Hwy 67 Bridge RM 30	Headed Upstream
12/7/2021	Clearwater Dam RM 0	Headed Upstream
4/11/2022	Clearwater Dam RM 0	Spawn 2022
4/12/2022	Hwy 67 Bridge RM 30	Headed Downstream
4/16/2022	Hwy 62 RM 109	Headed Downstream
4/18/2022	Current River RM 168	Headed Downstream

days. Females arrive and stay at the spawning riffles for a few days in early March and then move downstream. Walleye can travel long distances in a short period of time. One female fish in the study was detected at the receiver below Clearwater Lake dam on 4/11/2022 and was detected 11 hours later by the receiver at Hwy 67 (Hendrickson Access), 30 RM downstream.

Management Implications: Telemetry has shown that walleye are moving between rivers in the basin. The Black River strain of walleye is unique to this basin. Care must be taken when collecting broodstock fish to ensure the genetic integrity of walleye in the Black River Basin. Supplemental stocking of walleye in the basin should only be done with the Black River strain. Some fish make annual spawning runs from the Current River to the Black River below Clearwater Dam. To better understand movement patterns between the Black River and other rivers in the basin, we are putting additional transmitters in Walleye in other rivers (e.g., Current River and Eleven Point). The migratory nature of these fish makes it difficult to manage the fishery across jurisdictional boundaries, leading to collaboration with Arkansas Department of Game and Fish for best manage practices of this popular shared fishery.

For more information, contact:
Missouri Department of Conservation
2901 West Truman Blvd
Jefferson City, MO 65109
573-751-4115

Keywords: Walleye, telemetry, movement, Black River, Current River